



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

ON ORNAMENTAL WOODS.

BY A. AIKIN, SEC., F.L.S. F.G.S., &c.

Read 22d February, 1831.

IN the last illustration I explained the structure of wood in general, the mode of its growth, and the uses to which the various kinds of timber, whether native or imported, are applied in this country. On the present occasion I mean to direct your attention to those woods which, on account of their beauty, are employed by the cabinet-maker in the construction of various articles of household furniture, and of other objects of use or luxury.

Lustre, figure, and colour, are the elements of beauty in wood ; and if, instead of contenting ourselves with a vague perception, we wish to ascertain the reason why one piece of wood is more beautiful than another, we must compare them together, with reference to these three characters. It will also aid our comparison if we previously have investigated the variations which different kinds of wood present in these respects, together with the natural connexion which in many cases exists between them. This part of the subject, indeed, is entirely untrodden ground, and neither my time nor opportunities have been such as to have enabled me to give it the full investigation which its importance merits. You will, therefore, be pleased to bear in mind, that the remarks which I am about to make are deduced from the examination of a

few specimens, and that a more extensive inquiry will, no doubt, produce several modifications and limitations, though the general principles will, I believe, be confirmed.

First, with regard to the degree in which the beauty of woods is affected by their structure.

On examining the fibrous portion of wood, either with the naked eye, or by, what is still better, a low magnifier, we shall find it to consist of strings, or bundles of fine fibres, the general arrangement of which is parallel to each other. These fibres are more or less translucent, when held between the eye and a bright light, and have a smooth polished surface. The result of this structure is a variation or play of light, according to the angle under which they are viewed; and the degree of light, or the lustre, depends on the number of adjacent fibres that have their reflecting surfaces strictly parallel.

In the horse-chestnut, among the soft and light woods, and in the box, among the hard and heavy ones, few of the adjacent fibres are parallel; and, therefore, although the fibres, especially of the former, have, individually, considerable lustre, the face of the wood is very dull. But in those woods where the medullary plates are rather large, and very near together, the bundles of fibres take the form of gently waving ribands, in order to pass between and over them, being closely applied to the surface of every medullary plate that they come in contact with: now, as the surfaces of these plates are planes, the fibres, in passing over them, are necessarily reduced to the same plane, and thus become one reflecting surface. The sycamore exhibits this structure in a moderate degree. It is more remarkable in the English ash and in the mahogany, and still more in two Burmese woods of Dr. Wallich's collection. In the butt of a tree, in the crown of the

roots, and even in the trunk, where any irregularity of growth occurs, the fibres, in making their way downwards, are obliged to change their direction according to the obstacles that they meet with, and thus produce a tortuous, feathery, or wavy appearance, which, when combined with a considerable degree of lustre, is very ornamental.

The spongy or tubular part of the annual layers possesses, in general, hardly any lustre, and the sections of the tubes, that make their appearance when the wood is cut up for use, are for the most part defects, though sometimes tolerable by way of contrast. In the oak, the ash, the walnut, and the cedar, of ornamental woods, this structure is very conspicuous, and is generally a great defect. In mahogany the tubes are less coarse, and are distributed indifferently in every part of the yearly layer, so that, although they are a blemish to this otherwise incomparably beautiful wood, they are not so obtrusive as they would be if accumulated in particular spaces. In several kinds of English wood, as the lime, the pear-tree, the beech, and the birch, and in many foreign woods, the *lignum vitæ*, bird's-eye maple, plane, tulip-wood, satin-wood, and Coromandel-wood, the tubes are so small as hardly to be visible to the naked eye; and it may be stated as a general remark, which I believe is quite correct, that in the woods of tropical countries the tubes are found distributed in nearly equal proportion in every part of the annual layers, and the annual layers themselves are often very indistinct, probably on account of the trees continuing to grow during the whole year, instead of being quiescent for some months, as they are in the more temperate regions. The medullary plates contribute very essentially to the character of ornamental woods; not only

by being the secondary cause, as I have already shewn, of the lustre of most of those woods that are remarkable for this quality, but likewise by their own inherent properties. The structure of this part is invisible to the naked eye, and often, even to a low magnifier, it presents no distinction of parts, but appears to be wholly composed of a finely granular matter, which, under magnifiers of high powers, is resolved into a cellular structure. In general it is quite dull, and will not take a polish, though, in some few instances, I have found it of a silky lustre. In the oak the medullary plates are much larger than in any other wood that I have seen; and when their broad side is brought to the surface by a section a little oblique to the direction or run of the plates, they have this peculiarity, that they are dull when the fibrous part reflects the light, and, on the contrary, exhibit a bright silky lustre when the fibres are dull. In all the coloured woods that I have examined, with one exception, the colour of the medullary plates is much deeper than that of the fibres, and sometimes differs even in kind, so that, when viewed in different lights, they present different colours, like a shot silk. The plane is very remarkable for the size and distinctness of its medullary plates, these being of a rich chestnut brown, with a considerable lustre, while the fibres are nearly white, and almost dull. An equal contrast between these two parts exists in the so-called Botany-bay oak, with this difference, however, that the fibres have a good deal of lustre, while the medullary plates are dull. The beef-wood exhibits a similar distinction of parts, though on a smaller scale, and so do select specimens of common elm.

The satin-wood presents an entirely analogous intermixture of fibre and medullary plates, although it requires a magnifier to resolve this structure, on account of the

minuteness of the parts : the medullary plates are reddish brown, and without lustre, while the fibres have rather a considerable silky lustre, and are nearly white. On fixing the eye on any part or stripe, it will be found to vary its colour from shining whitish to dull chestnut, according as the light is reflected from the fibres or from the sections of the medullary plates. The same will be found in those parts of mahogany which present a varying lustre. In the laburnum there is this peculiarity, which I have not observed in any other wood, namely, that the medullary plates, which are large and very distinct, are white, whereas the fibres are a dark brown ; a circumstance that gives quite an extraordinary appearance to this wood.

Another source of variety in wood, both in figure and colour, depends on the comparison and contrast of one annual layer with another. If the circumstances which affect the deposition of wood acted with perfect uniformity, a cross section of the trunk of a tree would exhibit a number of perfectly concentric circular rings. This, however, is a case which probably never occurred ; and, in a great many instances, much irregularity takes place in this respect. This very irregularity is a source of beauty, and is capable of being indefinitely varied, by making the section more or less oblique to the axis of the tree. An alternation of colour not unfrequently accompanies these concentric rings, but not indicative of any change of structure ; and when the colours are lively, well defined, and well contrasted, their effect is very agreeable. King-wood, yew, tulip-wood, Amboyna-wood, partridge-wood, and lignum vitæ, are, perhaps, the most remarkable of such.

This symmetrical distribution of colour passes by insensible degrees into the striped, the veined, and the mottled, of which walnut, perhaps, affords the best example among

the commoner woods, and spotted and veined ebony, rose-wood, zebra-wood, and Coromandel-wood, among the more valuable ones. The three latter, in well-selected pieces, are particularly beautiful, especially the Coromandel-wood, whether we regard the harmonious tone of its colours, passing from brownish white to rich chocolate, and nearly black, or the broad masses in which they are arranged, giving it more the appearance of brecciated marble than of wood.

The last variety in the figure of woods that need be mentioned, is the occurrence of eyes, zoned spots, and small curls, which, although hardly suited to the larger kinds of cabinet furniture, is often extremely ornamental in small tables or stands, desks, work-boxes, and such other articles as usually come under close inspection. Bird's-eye maple, Amboyna-wood, and the root or butt of the common yew, and of the common maple, are perhaps the most beautiful: the knobby tubercles that form on the root and trunk of the common elm, from repeatedly stripping off the side branches, as is the general practice round London, afford occasionally very beautiful pieces, which are employed for tea-caddies and other small articles, by the name of curdled elm.

It is not known when the colours and veinings of wood first attracted attention, and occasioned a preference to be given on this account to one kind of wood over another. The taste of the Greeks appears to have been almost exclusively directed to sculpture as a source of ornament, and therefore, although we occasionally meet with descriptions of wooden drinking-cups in the poems of Homer,* of Theocritus,† and other writers, the notice of the reader is

* *Odyss.* ix. 345.

† *Idyll.* i. 26.

never directed to the material, but to the elaborate carving of foliage and of figures with which they were enriched. We are certain, however, that the Romans began to pay attention to the subject in the generation prior to the Augustan age, when luxury of all kinds was at its height. In the writings of the satiric and epigrammatic poets who flourished under the Cæsars, we meet with frequent allusions to the enormous sums given for tables of ornamental wood ; but the most copious and interesting account of this department of luxury is to be found in the Natural History of Pliny the elder,* from which the following particulars are extracted.

By far the most costly wood was procured from a tree called citrus, a native of that part of Mauritania which is adjacent to Mount Atlas. In leaf, odour, and trunk, it resembles the female wild cypress. The valuable part is a tuber or warty excrescence, which, when found on the root and under ground, is more esteemed than when growing on the trunk or branches. When cut and polished it presents various figures, of which the most esteemed are curling veins, or concentric spots like eyes, the former being called tiger-wood, the latter panther-wood. Sometimes both these figures are mixed, producing a resemblance to the feathers in a peacock's tail. The colour appears to have been a warm brown of different shades. The only polish that they ever received was given by long rubbing with a dry hand. Tables of this material appear to have been first brought into fashion by Cicero, who is said to have given for a single one a million sesterces, *i. e.* 8072*l.* One belonged to Gallus Asinius, which was valued at 8879*l.* Two, which had formerly

* Plin. Hist. Nat. xiii. 29 ; xvi. 24, 84.

belonged to King Juba, were actually sold, one for 9700*l.*, and the other for somewhat less. Another, which had been for some generations in the family of the Cethegi, was sold for 11,300*l.*, and in the time of Pliny was accidentally destroyed by fire. The largest ever known belonged to Ptolemy, king of Mauritania : it was four feet and a half in diameter, and four inches thick, being formed of two semicircular planks, so skilfully joined that the place of juncture was not discernible. These tables were generally set in a broad border of ivory. From the above description the Mauritanian citrus seems to have been a species of juniper, and is not to be confounded with the citron, or any other species of the genus *Citrus* of modern botanists. I mention this because in Italy they actually employ at the present day the old trunks of the lemon, orange, and citron, for painters' palettes, and other small articles of a like description.

The maple, also, was highly esteemed by the Romans, especially that which grew in Istria and Rætia, and was distinguished by its curled peacock-tail veins. In beauty, Pliny says, it exceeded even the citrus, but could be obtained only in small pieces for writing-desks and similar articles.

In the time of Pliny the art of veneering was a recent invention ; and he descants, in his usual antithetical way, on thus converting the cheaper into the most valuable woods, by plating them with these latter ; and of the ingenuity of cutting a tree into thin slices, and thus selling it several times over. The woods employed for this purpose were the citrus, the terebinth, various kinds of maple, box, palm, holly, ilex, the root of elder and poplar. The middle part of a tree, he observes, shews the largest and most curling veins, while the rings and

spots are chiefly found near the root. The veneers, or plates, were secured, as at present, by strong glue.

Of the ornamental woods now used in this country, mahogany, unquestionably, claims the first place; both because a greater quantity of it is employed than of all the other ornamental woods put together, and because it is applicable to every kind of cabinet ware, great and small. It varies much in quality and, proportionally, in price: for a log of the finest kind as much as 800*l.* has been given, and, I believe, even more. There are two kinds distinguished in the market, namely, the Honduras mahogany, from the Mosquito shore, and the Spanish, which grows in the island of Cuba. The former is generally the most in request; but, occasionally, very splendid specimens of the latter come to hand. In the Honduras mahogany, the medullary plates are large, and generally disposed in rows; the consequence of which is, a high colour, much lustre, and rather a coarse grain. In the common, or Spanish mahogany, the medullary plates are small, and irregularly distributed; hence, the colour is paler, the lustre less, and verging to silky, and the grain is finer, than in the preceding. The inferior kinds are used solid; the finer varieties are cut into veneers.

Next in use is rose-wood, a native of Brazil. It exhibits large elongated zones of black irregular lines on a reddish-brown ground, of various tints and high lustre. The grain varies, being often rather coarse, but, in selected specimens, sufficiently fine. The dark colour, in general, rather too much prevails; but when this is not the case, and the lighter ground is disposed in larger masses than usual, the wood is exceedingly beautiful.

A West Indian wood, that goes by the name of coccus,

bears a great resemblance to rose-wood, only the colour is less red.

King-wood, likewise, comes from Brazil. Its general colour is a rich yellowish brown, deep in the veins, more dilute in the other parts. It has a fine grain and a moderate lustre; the smaller pieces are often striped, and sometimes it occurs full of elongated zoned eyes.

Zebra-wood—also, I believe, from Brazil—resembles king-wood, only the colours are generally disposed in irregular, but angular, veins and stripes. It is a very fine wood.

Coromandel-wood, from its name, I presume, is a native of India. It consists of pale reddish-brown fibres, crossed by large medullary plates of a deep rich brown, passing into black: these latter are chiefly conspicuous in well-defined veins and broad spots, admirably contrasting with the lighter parts; the lustre is silky where the medullary plates are small, but higher and more varying where the plates are larger and the grain coarser. It is, unquestionably, the handsomest of all the brown woods.

Giaca is, I believe, a Brazilian wood, and is exceedingly handsome, on account of its rich hair-brown colour, its fine grain, and high lustre.

Other brown woods are,—

Snake-wood, from Demerara, in which the lines often bear a kind of resemblance to writing.

Crocus-wood, from Brazil.

Lignum-vitæ, from the West Indies; the colours of which are generally dull, dingy, and ill-defined.

Green ebony, from the West Indies, in which a greenish tint is discernible by daylight, but dingy and dull.

Sandal-wood, from Owyhee ; of a pale brown, a very fine grain, and a considerable satiny lustre.

The only perfectly black wood is ebony from Africa : that from the Mauritius and Ceylon is usually variegated more or less with cream-brown, and is sometimes very handsome ; sometimes it produces accidental resemblances to moonlight falling on black clouds. Perhaps the Coromandel-wood is a variety of spotted ebony.

Of woods in which yellow, mixed more or less with orange and brown, is the prevailing colour, may be mentioned the satin-wood of India and of the West Indies, the former of which has the richer colour, the latter the higher and more variable lustre.

Fustic also belongs to this class, forming the passage to the orange-brown woods. It has a high varying lustre, with moderate fineness of grain.

The red woods are not much used for ornament, except in small pieces for inlaying. Of these—

Africa furnishes the cam-wood and the barr-wood, this latter being distinguished by its rich purple tinge :

India furnishes red sanders :

Brazil furnishes tulip-wood and beef-wood :

And the West Indies, the pencil-cedar, or juniper, and the Havannah cedar ; this latter being remarkable for its high, varying, and completely silky lustre.

A singular wood has lately been imported from Russia, where it is dug out of the bogs. It seems to be a birch ; the ground is pale yellowish, but is prettily and singularly variegated by dark curved lines.

New Holland furnishes a wood of no great beauty, called Botany Bay oak.

The bird's-eye maple comes from the United States ; and, although deficient in colour, merits notice from the

eyes, and the very pretty, though small, markings with which its surface is overspread.

Our own country furnishes yew, of which the tubers and parts near the root are often extremely beautiful: for the combination of colour with figure, it ranks, perhaps, at the head of the eyed, or spotted, woods. Walnut was formerly very extensively used as veneers for chests of drawers, and other large articles, in which it has of late years been superseded by mahogany. Its chief use at present is solid, for gun-stocks, many of which are extremely beautiful. The butt and larger roots of maple are likewise employed for gun-stocks, as well as selected pieces of ash, which, when properly coloured, shew off their native lustre and figure to great advantage. The oak occasionally presents very rich figures; and tables made of such are much esteemed, notwithstanding its deficiency in variety and vivacity of colour.

Veneers used to be cut by the hand-saw; at present, the circular saw is, I believe, universally employed in England for this purpose, with the advantage, not only of cheapness and expedition, but of a smaller waste of wood in sawdust, and for greater accuracy and precision in the thickness of the veneer—a quality essentially requisite to produce good work in the finished article.

In a large veneer-mill which I had an opportunity, through the kindness of one of our members, of visiting, there are five circular saws. Each consists of a strong, stiff, circular frame-work, of the shape of a plano-convex lens, or rather a low hollow cone, tapering gradually to the edge, from which projects a ring of soft steel a few inches broad, pierced with many holes. The saw is a plate, or rather a flat ring, of well-tempered steel, about twelve inches broad, pierced with as many holes as the

former ring, and firmly secured to it by means of screws : a band over the axis of the saw communicates motion to it, by connecting it with the first mover, which is a steam-engine. The wood to be cut is laid on the cross-bars of a frame, which are previously covered with glue, and remains in a horizontal position, loaded with heavy weights, till the glue has become dry. The frame, with the log, or *fitch*, as it is technically called, adhering to it, is then fixed sideways in a carriage which traverses backwards and forwards, the frame itself being likewise capable of motion at right angles to the run of the carriage, in order to project the log sufficiently to bring it within the action of the saw. The quantity of the latter motion is regulated by a screw, one turn of which throws forward the frame, and, consequently, the log, about $\frac{1}{30}$ of an inch. The saw being put in motion, the workman first turns the regulating screw more or less, according to the required thickness of the veneer ; he then, by pulling a lever, throws the apparatus into gear, which gives motion to the carriage, and takes his seat by the inner, or convex, side of the saw. As soon as the log comes up to the saw, he directs the head of the veneer into a curved frame, which it readily enters, on account of its flexibility, being so very thin, and then employs himself in holding in each hand a chip of wood obliquely against the teeth of the screw, in order to clear them of the particles of sawdust which otherwise would more or less clog them up. In a minute or two the log has passed the saw, the motion of the carriage is reversed, and it is brought back to the point from which it first started. Being then thrown out of gear, the regulating screw is again turned, to project the log as much as the intended thickness of the next veneer ; and then all those motions are repeated which I have

already described. The usual thickness of a veneer is about $\frac{1}{12}$ of an inch ; but some kinds of wood may be cut as thin as about $\frac{1}{16}$ of an inch. About half the wood is converted into sawdust.

Of the fine saws employed at these mills, the largest is eighteen feet in diameter, and makes thirty revolutions in a minute. Three are each ten feet in diameter, with a speed of about sixty revolutions in a minute ; the small saw is six feet in diameter, with a speed of eighty revolutions in a minute, which is sometimes increased to one hundred, or even one hundred and twenty revolutions. The teeth of the saws are nearly a quarter of an inch deep. A saw lasts about a year ; for the first six months it is employed in coarse work, and afterwards, till worn out, in fine work.

The veneer is necessarily split, for an inch or two at its head, in getting it on the curved frame ; and as it is likewise liable to split in drying, a thin strip of linen is glued along the two cross edges of each veneer, which prevents this accident : the holes, at least those of an inch or more across, are also covered in the same manner.

The general method of laying down veneers is very simple, although to do this well and correctly requires, as every thing else does, practice, attention, and patience. The under side of the veneer, if previously smooth, must be scored by means of a tothing-plane ; but if cut by a circular saw, it generally acquires a sufficient tooth by that operation. The surface to be veneered is covered over with strong glue, and before it chills or gelatinizes, the veneer, previously prepared and cut to the shape required, is laid down upon it, care being taken, in doing so, to inclose as little air as possible. When it has been pressed down to its proper bearing in every part, the

compound piece is enclosed between two hot boards, secured at the edges by thumb-screws, or, which is still better, is put into a press between two hot plates, where it remains till perfectly dry.

The next process is to give a smooth surface to the veneer, which is effected by first filling up any holes by plugs of the same kind of wood cut to fit them, or by making a paste of fine sawdust and glue, and pressing it into the holes by hand, and then by the successive use of small planes, scrapers, files, glass-paper, Dutch rushes, and fish-skin. Lastly, a varnish is added, which has the effect of bringing up the colour and lustre of the wood, and protecting it from the action of the air. If the colour of the wood is itself unexceptionable, the varnish should be as colourless as possible ; but if a little mellowness or warmth is required, a varnish coloured accordingly must be applied. The so-called French varnish has within the last few years almost entirely superseded the oil varnishes, as being more quickly applied, possessing more lustre and hardness, being much less liable to be injured by any common liquid spilled upon it, and not requiring to be renewed or refreshed except at long intervals. It is made by dissolving lac in spirits of wine, and then shaking it up with olive-oil to the consistence of an emulsion, in which state it must be used. It is fixed on the surface of the wood by means of a linen rubber, applied with a circular or spiral motion.